

## UPDATES AND CURRENT STATUS OF THE HITRAN APPLICATION PROGRAMMING INTERFACE (HAPI)

ROMAN V KOCHANOV<sup>a</sup>, IOULI E GORDON, LAURENCE S. ROTHMAN, YAN TAN, *Atomic and Molecular Physics, Harvard-Smithsonian Center for Astrophysics, Cambridge, MA, USA*; JOSHUA KARNs, WYATT MATT, *Computer Science, State University of New York at Oswego, Oswego, NY, USA*; CHRISTIAN HILL, *Atomic and Molecular Data Unit, International Atomic Energy Agency, Vienna, Austria*.

The HITRAN Application Programming Interface (HAPI)<sup>b</sup> is a powerful tool for working with spectroscopic data in the gas phase. HAPI provides access to the capabilities of the HITRAN*Online* (<http://hitran.org>) web information system with the recent edition of the HITRAN2016 spectroscopic database<sup>c</sup>. Besides an access to HITRAN*Online*, HAPI allows working with user-supplied data. Among the capabilities are data filtering and analysis, as well as modeling of gas absorption with the fine tuning of many parameters (gas mixture, path length, instrumental function, temperature, and pressure). In this talk we present the update for HAPI (v.2.0) which has the following features: 1) access to line-by-line spectroscopic transitions and experimental cross-sections from HITRAN2016; 2) access to the metadata for molecules from the line-by-line part, and more than 300 molecules from the cross-section part, as well as for the database bibliography; 3) seamless use of the foreign broadening and shifting parameters, and non-Voigt line profiles, relevant for atmospheric and planetary applications; 4) use of the custom CPF implementations; 5) updated partition sums from the recent TIPS software<sup>d</sup> covering wider temperature ranges; 6) line mixing support. The new version features HAPIEST (HAPI and Efficient Spectroscopic Tools) – a portable graphical user interface providing access to HAPI features. HAPI v.2.0 is available at the official HITRAN*Online* site as well as through the Github repository (<https://github.com/hitranonline/hapi>). The HAPIEST open source package with binary installers will be available at HITRAN*Online* upon release. This effort is supported through the NASA AURA (NNX 17AI78G) and NASA PDART grants (NNX16AG51G).

---

<sup>a</sup>QUAMER, Tomsk State University, Tomsk 634050, Russia

<sup>b</sup>Kochanov RV, Gordon IE, Rothman LS et al. JQSRT 2016;177:15–30. doi:10.1016/j.jqsrt.2016.03.005.

<sup>c</sup>Gordon IE, Rothman LS, Hill C, Kochanov RV, Tan Y et al. JQSRT 2017;203:3–69. doi:10.1016/j.jqsrt.2017.06.038.

<sup>d</sup>Gamache RR, Roller C, Lopes E, Gordon IE, Rothman LS et al. JQSRT 2017;203:70–87. doi:10.1016/j.jqsrt.2017.03.045.